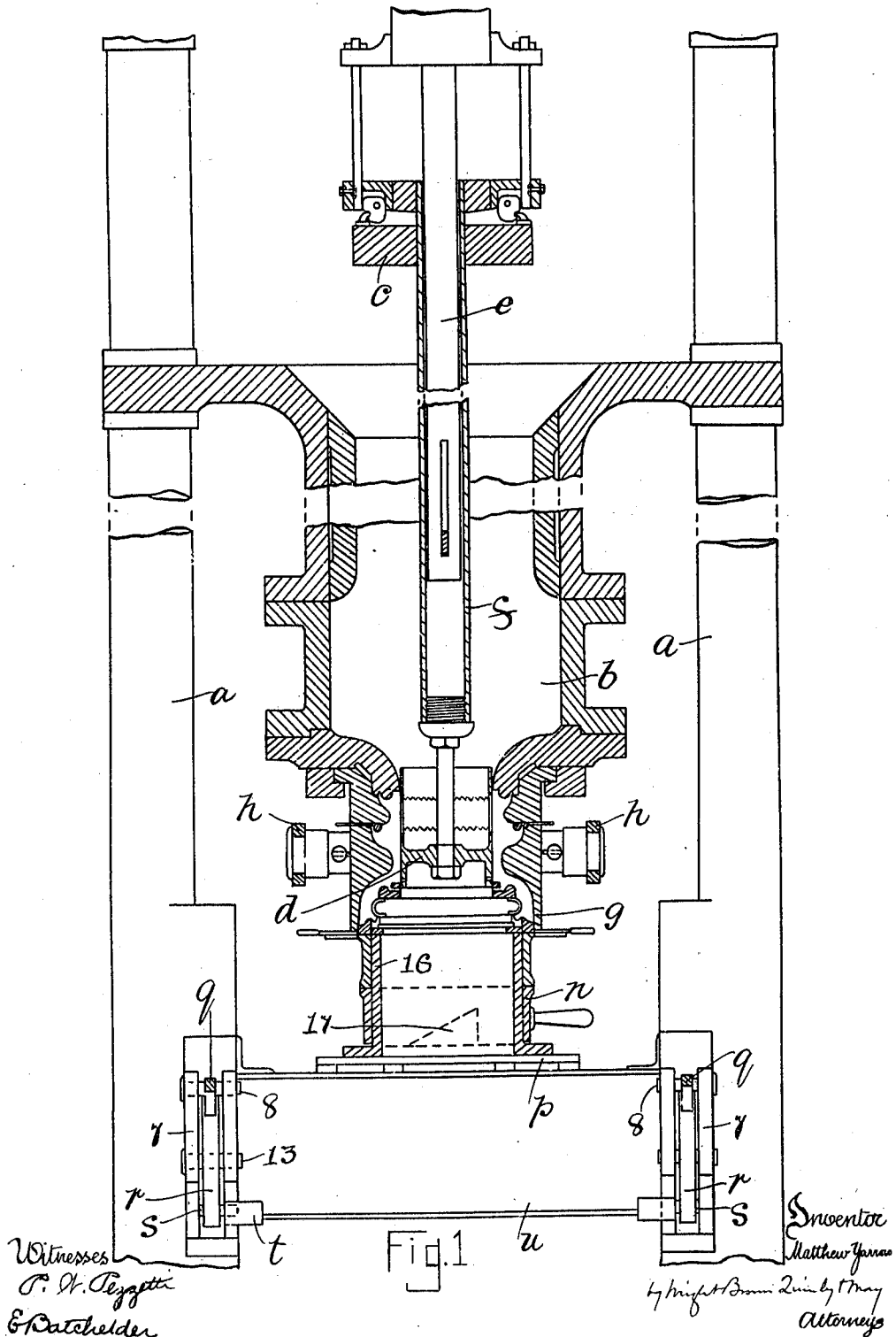


M. YARROW.
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APPLICATION FILED SEPT. 18, 1908.

978,347.

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3 SHEETS-SHEET 1.

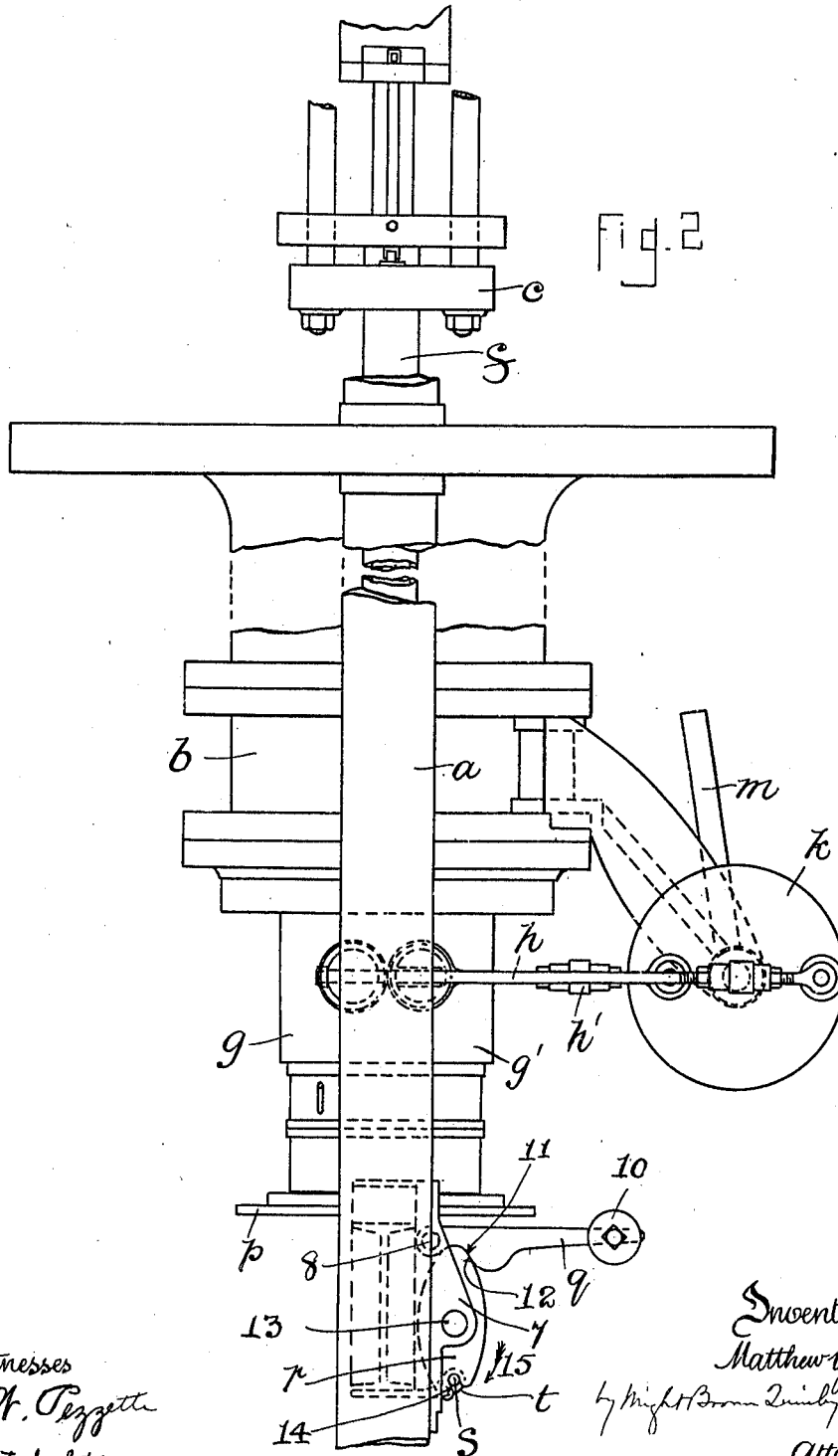


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3 SHEETS-SHEET 2



Witnesses
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3 SHEETS—SHEET 3.

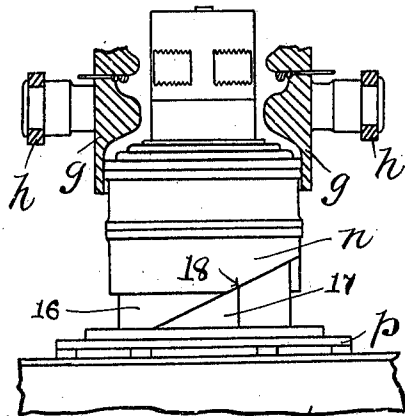
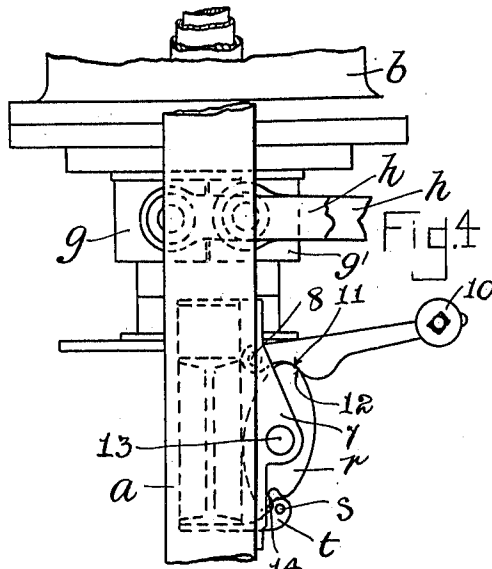
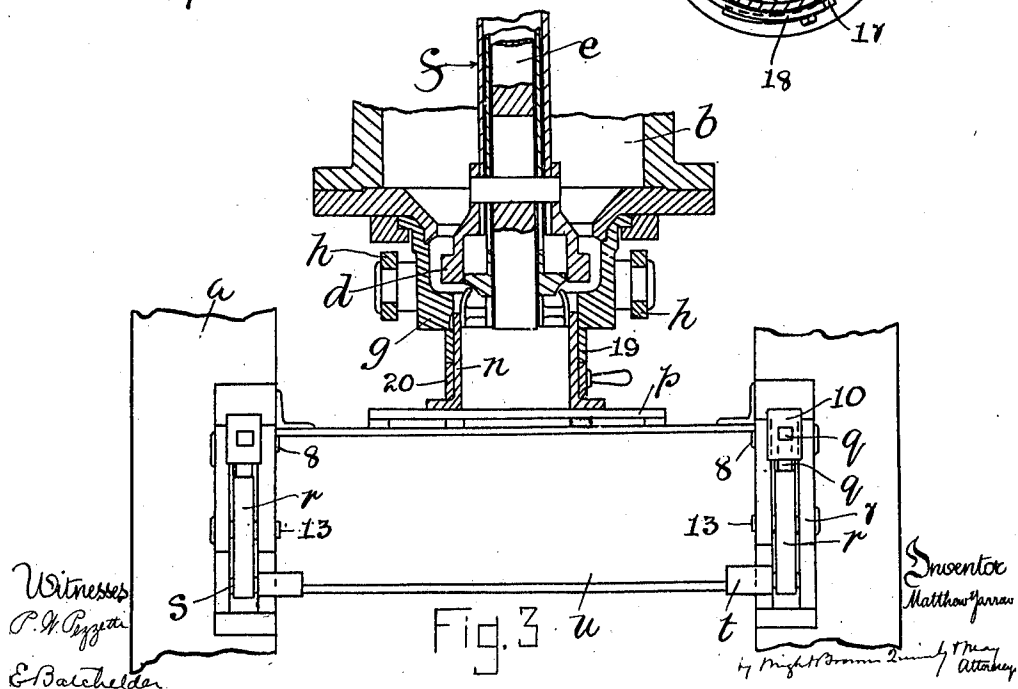
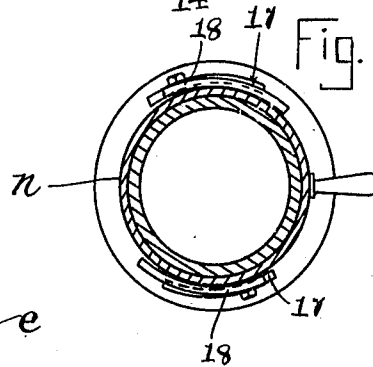
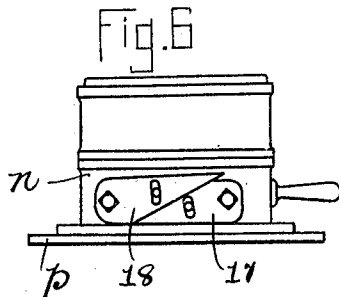
Fig. 5 *u*

Fig. 7



UNITED STATES PATENT OFFICE.

MATTHEW YARROW, OF SMITHILLS, BOLTON, ENGLAND, ASSIGNOR TO YARROW AND COMPANY (BOLTON) LIMITED, OF BOLTON, ENGLAND.

MACHINE FOR THE MANUFACTURE OF EARTHENWARE PIPES.

978,347.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed September 18, 1908. Serial No. 453,682.

To all whom it may concern:

Be it known that I, MATTHEW YARROW, a subject of the King of Great Britain, and resident of 9 Ivy road, Smithills, Bolton, in the county of Lancaster, England, have invented certain new and useful Improvements in Machines for the Manufacture of Earthenware Pipes, of which the following description, together with the accompanying sheets of drawings, is a specification.

In the production of earthenware pipes or mains, retorts and the like, by pressure exerting machinery or apparatus as is well understood, at the commencement of the pressing operations the operative has to arrest or shut off the pressure when he has observed that the die or mold surrounding the core has been filled with clay. This is necessitated in order to relieve the locking devices which support the table so that the operative may remove such locking devices to enable the table to recede or descend as the pipe is pressed or formed on the pressure being again applied to these parts. By or in consequence of this operation being thus carried out it is clear that on account of the resistance of the fixed table at the commencement of the pressing operations, the clay is far more firmly compressed than it is subsequently when merely flowing through the molds against the resistance of the receding table; hence irregularities in the density of the pipe result and cause cracks and warping during subsequent treatment. To obviate this by the application of means which will afford more regular resistance to the flowing of the clay as it is being compressed or forced through the dies or molds and which will enable the table to commence its receding movements immediately the clay has been forced within and to fill the molds, and that without having to arrest the pressing operations prior to such receding actions being started is the object of my present invention. To attain this object I make use of the devices illustrated by the accompanying sheets of drawings wherein:—

Figure 1 is part sectional front elevation of a machine of well known type to which my improved parts have been applied. The dies or molds in this figure are for produc-

ing a special kind of pipe or main as hereinafter explained, and such pipe or main is produced with the socket end down or resting upon the table. Fig. 2 is a side elevation of the parts shown by Fig. 1. Fig. 3 is a similar view to a portion of Fig. 1 but shows the parts as formed to produce an ordinary form or shape of pipe or main and that with the socket end at the top or with the spigot end resting upon the table. Fig. 4 is a similar view to part of Fig. 2 but shows certain of the parts in the positions which they assume when being made to yield on the dies or molds having had the proper or desired amount of clay forced into them. Fig. 5 is a drawing of a part in detail and shows same in an altered position as compared with that shown by Fig. 1. Figs. 6 and 7 are drawings illustrating a part shown by Figs. 1 and 5 in detail with certain modifications hereinafter explained.

In the accompanying sheets of drawings *a* indicates the pillars upon which the several parts are mounted, *b* the cylinder within which the plunger *c* presses or forces the clay in manner well known and *d* the core which is guided by a central shaft *e* over which takes its supporting sleeve *f*.

The outer molds or dies *g, g'* are shown as being formed in two semi-annular parts so that they may be moved apart or separated to leave the pipe or main, when formed, free so that it may be removed from the machine, and these dies *g, g'* are thus actuated by being coupled by the connecting rods *h, h'* to the crank disk *k* which the operative moves through a partial rotation by means of the handle *m*. According to the present invention the molds or dies *g, g'* are made to receive an annular piece *n* which is mounted upon the table *p* upon which table *p* the pipe or main on being pressed through the dies *g, g'* is deposited. This annular piece *n* is made to fit within the dies *g, g'* in such a manner that on the clay being forced down upon it, it will recede and cause the table *p* to descend against the counteracting weighted levers *q*. These levers *q* are pivoted at 8 to the bearings 7 fixed upon the pillars *a*, and have adjustable weights 10 mounted upon them to cause their inclined

edges at 11 to press more or less upon the rounded ends 12 of the levers r as their weights 10 are adjusted farther from or nearer to their fulcrums 8 as will be understood. The levers r are also pivoted at 13 upon the bearings 7 so that their lower extremities may have notches made in them to form inclined surfaces 14 over which the pins s may slide in order to transmit motion to said levers r in the direction indicated by the arrow 15 with the result hereinafter explained. The pins s are fixed upon the extending arms t which are secured to the cross beam u upon which is fixed the table p .

On commencing to press or produce a pipe or main, the clay is forced in the well known manner down into the dies g, g' where it encounters the upper edge of the annular piece n upon which it commences to press when all the parts of the dies have been filled with it. This pressure of the clay is resisted by the actions of the weighted levers q over the levers r until such pressure is sufficient to overcome same, on which the table p commences to descend and its pins s, s press upon the inclines 14 of the levers r causing same to move so that by their ends 12 they will slide over the inclined parts 11 of the levers q and raise same against the actions of their weights 10 until said pins s have moved beyond the ends of the inclines 14 after which the pressing of the remaining part of the pipe is continued under the usual and well known means for retarding the descent of the table p and that without the descending motions of said table p or the pressing actions of the plunger c being arrested until the complete and finished pipe is produced. On the pressing operations being finished the core d is raised by the plunger c , on its return, engaging with the flange at the upper end of its sleeve f in this manner said core d passes through the opening in the bottom of the cylinder b and so cuts off said newly pressed pipe from the clay within said cylinder b .

In the production of pipes or mains with the socket part at the bottom or resting upon the table p , which system may be followed when manufacturing either common ordinary pipes or in forming others of special shape such as those having radiating flanges on their spigot ends and which require dies g, g' of the shape shown by Fig. 1; then the annular part n may be mounted upon another or inner annular part 16 so that by inclines 17 made or fixed on this latter, other inclines 18 (which may be inverted) fixed to the former may rest thereon by which means on the pressure of the clay upon the upper edge of the annular part n reaching a certain degree the part n is caused to recede by its inclines 18 sliding over the inclines 17 beneath at which time the part 16 will rotate. By this arrangement the operator re-

ceives notice that the portion of the pipe that is being formed has received the desired pressure. The cams or inclines 17 and 18 may be made so that they may be adjusted upon their respective parts n and 16 in order to meet the requirements of more or less dense or stiff clay. This form of annular piece n may be used in conjunction with the locking lever devices q, r hereinbefore described.

Such being the nature and object of my invention, what I claim is:—

1. A machine for producing earthenware pipes or mains, comprising a cylinder, a plunger operating therein, dies arranged to receive material from said cylinder, a core coöperating with said dies, a table for receiving the molded articles as they are formed, counterbalancing levers for said table, and means connected to said table for moving said counterbalancing levers.

2. A machine for producing earthenware pipes or mains, comprising a cylinder, a plunger operating therein, dies arranged to receive material from said cylinder, a core coöperating with said dies, a table for receiving the molded articles as they are formed, counterbalancing levers for said table, cam levers for moving said counterbalancing levers, and means connected with said table for controlling said cam levers.

3. A machine for producing earthenware pipes or mains, comprising a cylinder, a plunger operating therein, dies arranged to receive material from said cylinder, a core coöperating with said dies, an annular member projecting into said dies for supporting the molded articles, a table upon which said member is mounted, counterbalancing levers for said table, and means connected with the table for moving said levers.

4. In a machine of the class described, a cylinder a plunger acting within said cylinder, dies and a core mounted in connection with said cylinder, a table arranged to receive the pipes produced, projecting pins carried by said table, levers pivoted on the framework and having inclined ends for the engagement of said pins and rounded ends to engage with inclines formed on weighted levers, and said weighted levers substantially as herein specified.

5. In a machine of the class described, a cylinder, a plunger in said cylinder, dies and a core mounted in connection with said cylinder, an annular piece taking within said dies, inclines on said annular piece, another annular piece beneath the former, inclines on this latter for engagement with the inclines on the former and a table for supporting said annular pieces, substantially as herein set forth.

6. In a machine of the class described, a cylinder, a plunger within said cylinder, dies and a core mounted upon and in connection

with said cylinder, annular pieces having inclined parts so that one may support the other within the dies, a table on which said annular pieces may be mounted and locking
5 levers for securing said table substantially as herein specified.

In testimony whereof I have hereunto af-

fixed my signature in presence of two witnesses.

MATTHEW YARROW.

Witnesses:

SAMUEL HEY,
JOHN WHITEHEAD.